The Development of Vocational Interest Using Holland's Typology: Realistic Occupational Choice Inventory for Engineering Technology

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This study focused on the Realistic Occupational Choice based on John L. Holland typology of Vocational Personalities (RIASEC). The Realistic occupations include skilled, trades, technical, and some service occupations. In response to the research findings of Holland Theory of Vocational Choice that a simple occupational knowledge test can be devised to explore the relationships hypothesized in the theory and to examine and classify typical occupations. The Realistic Occupational Choice Inventory was constructed for the purpose of assessing the students' occupational interest in career choices in service, technical, and engineering occupations. There is a need to construct a standardized scale that can assess the interest of the Filipino students in realistic occupations since there is no specific scale that measures Filipino skilled, service, technical, and engineering occupational interests. The results of the occupational interest inventory will assist the students to come up with better career decision so that they can perform better academically and choose a career that will prepare them before they enter the world of work. A Principal Component Analysis with varimax rotation was used to identify the subscales of the realistic factor. The scale indicates a very high internal consistency among the items with a Cronbach's alpha value of .96.

Keywords: RIASEC, Realistic, Skilled and service occupations

With the increasing demand for knowledgeable and skilled workers in this dynamic society, industries have developed linkages with academic institutions for their pool of workers. In developing countries like the Philippines, the role of technician as workers and engineers in the economy is significantly important as the country becomes more industrialized using modern production techniques. For this reason, it is the duty of the technician and engineering education system acting on behalf of its students and graduates to anticipate employers' preference for the services of technicians and engineers in terms of numbers, varieties, and quality to provide the economy with the right type of workforce (Tadeo, 1988).

According to Kochhar (2007), reality work is said to be the central and essential part of man's

life. It cultivates him and makes his life meaningful and purposeful. Work has a profound role in establishing a person's life space, emotional tone, family situation, object relations, and where and how he will live. The kind of work that individual prefers to be involved can be perceived with his vocational choice and preferred occupational environment.

The Holland's Theory of Vocational Choice helps individuals to make better career decisions based on their preferred occupational environment. The core idea of this theory stated that most people resemble a combination of six personality types: RAISEC R – Realistic, I – Investigative, A – Artistic, S – Social, E – Enterprising, C – Conventional. Each type is characterized by a constellation of interests, preferred activities, beliefs, values, and characteristics. The RIASEC structure is the most widely used model of organizing career interest assessment instruments (Nauta, 2010).

Holland in 1959, presented a paper which attempted to delineate a theory of vocational choice which was comprehensive enough to integrate existing knowledge and at the same time sufficiently close observables to stimulate further research. Holland assumed in his theory that at the time of vocational choice, the person is the product of the interaction of his/her particular heredity with a variety of cultural and personal forces including peers, parents, and significant adults, his social class, and the physical environments. Out of this experience, Holland mentioned that the person develops a hierarchy of habitual or preferred methods for dealing with environmental tasks. Holland's RIASEC was first labelled and classified in the different occupational environments that are useful in organizing the person's vocational choice. Holland mentioned that at the time of vocational choice the person has a set of adjustive orientations. The adjustive orientations, corresponding to the six occupational environments, which are designated as motoric, intellectual, supportive, conforming, persuasive, and esthetic methods or orientations. Holland conceptualized each type as having distinctive lifestyle, preferred methods of dealing with problems, interpersonal skills, and other personal factors, and Holland clearly stated that interest inventories are personality inventories (Nauta, 2010). The first major revision of the theory more clearly specified the role of the environment, the revision also provided more explicit definitions of the main concepts and it included more comprehensive descriptions of the types. According to Nauta (2010) the most notable revision version of the theory was the 1973, the RIASEC labels were used for the types when there was an explicit incorporation of the hexagon for assessing the degrees of congruence and determining consistency among personality and environment types.

One of the previous occupational environment of designated in Holland first theory was the environments. The motoric environment which include occupations as labourers, machine operators, aviators, farmers, truck, drivers, and carpenters. Holland stated that persons with this orientation enjoy activities requiring physical strength, aggressive action, motor coordination, and skill. These people prefer to deal with concrete, well-defined problems as opposed to abstract, intangible ones; they prefer to act out rather than to think through problems. They avoid situations which require verbal and interpersonal skills, because they lack that skills and are often threatened by close relationship with others. They conceive of themselves as aggressive, strong, masculine persons with conventional political and economic

(Holland, 1959). This motoric environment was similar to the descriptions set in the RIASEC, as Realistic (R) environment also involves skilled, trades, technical and some service occupations. Both have the same core activities such as labourers, machine operators, aviators, farmers, truck, drivers, and carpenters. Holland stated that persons with this orientation enjoy activities requiring physical strength, aggressive action, motor coordination, and technical skill.

The study by Felman et al. (1999) wanted to test the further the assumption of Holland's theory of personality types and environments that achievement of people is a function of the congruence or "fit" between their personality type and their environment. Holland's theory further assumes that each personality type is most likely to flourish in a corresponding environment (that is, the environment having the same label). Because this environment provides activities, tasks, and roles congruent with the competencies, interest, and self-perceptions of its parallel personality type (Felman et al., 1999).

The study of Anderson et al. (1997) examined the invariance of Holland's vocational interest model across gender to resolve the question concerning whether the theory was applicable for men and women. Results of the study indicated that males and females have similar RIASEC structures on the Strong Interest Inventory. Results and analyses comparing the fit of both the circular order form and circumplex form of Holland's model to the male and female samples were all non-significant, indicating that these models are a no more or less accurate representation of the observed data for men than for women (Anderson et. al, 1997). The researchers aimed to identify gender differences in misfit of Holland's model also yielded no evidence of differential fit.

Holland (1997) suggests that students will be more satisfied and perform better academically if they choose a major environment that is congruent with their interest. Individual search for and enter work environments that permit skills and abilities, express their attitudes and values, and take on agreeable problems and roles. The vocational identity among persons has been shown to be associated with occupational commitment, life satisfaction, well-being, adjustment, career decision making, self-efficacy, and career-choice readiness (Grotevant & Thorbecke, 1982).

Holland hypothesized that the persons with more information about occupational environment make more adequate choices than do persons with less information. The validity of this hypothesis was suggested by Stone's study, 1948 in vocational counselling on the effects of occupational courses. The research findings suggest that a simple occupational knowledge tests might be devised to explore the relationships hypothesized in the theory concerning the amount of selective perception of occupational information. The proposed occupational environment classification might be examined and classified rationally by reviewing the evidence for a sample of typical occupations for each orientation at each level.

In response to the research findings of Holland's Theory of Vocational Choice, a simple occupational knowledge test can be devised to explore the relationships hypothesized in the theory and to examine and classify typical occupations. The Realistic Occupational Choice Inventory was constructed for the purpose of assessing the students' occupational interest and career choices in skilled, service, technical, and engineering occupations. There is a need to construct a standardized scale that

will assess the interest of the Filipino students in realistic occupations specifically in technology and engineering service occupations since there is no specific scale that measures this domain. The results of the occupational interest inventory will assist the students to come up with better career decision so that they can perform better academically and choose a career that will prepare them before they enter the world of work.

The result of this scale will help career counselors to help individual in assessing the person capabilities in pursuing a realistic vocational choice specifically in technology and engineering courses that will fit their occupational interest.

Method

Participants

A total of one hundred thirty five (135) second year technology engineering students from the different courses: Automotive, electrical, electronics, mechanical and refrigeration and airconditioning service works were selected as respondents. The participants age ranges from 17-20 years are in their major field of specialization and presently involved in acquiring the expected competencies in their field. The purpose of the Realistic Occupational Choice Inventory-Questionnaire (ROCI-Q) was explained to the students before the test was administered.

Instruments

The original Realistic Occupational Choice Inventory Questionnaire (ROCI-Q) was created using Holland's RIASEC typology. This inventory focused on the Realistic (R) factor which includes the skilled, trades, technical, engineering, some service occupations such as manipulation of tools and machines. The occupations required technical competencies in order to do the activities involved in repair, maintenance and follow some preventive measures in electronic, electrical, mechanical works.

The Realistic factor has five subscales of skilled and service occupations: (1) Automotive (2) Electrical (3) Mechanical (4) Refrigeration and Airconditioning works and (5) Electronics. Each subscales has 20 items reflecting the core activity of the skilled and service occupations, based on the O*NET Data of categories of occupational information and technical skills. It is also consistent with the expected competency required by the Technical and Education and Skills Development Authority (TESDA).

The automotive occupation provides the essential service in the field of quality control, performance testing, engine assembly and operations; technical background on diagnostic process, precision measurements and cost estimate for repair works in automobile. The electrical occupation provides training in power generation, transmission, and distribution; control and power utilization with emphasis on integration of principles and application of method analysis to electrical processes and equipment. The trainees are trained to maintain service and repair electro-mechanical devices, supervise building wiring; do cost estimating; perform simple design work; maintain and service electrical appliances and do other related

electrical tasks. The electronics service occupation provide competency in the application of electronic devices, analysis of resistive and reactive circuits and understanding their use on solid devices as well as integrated circuits. The workers are expected to perform or function productively in the area of research and development, quality control, repair, calibration and maintenance, service and installation and sales of electronic equipment and system. In mechanical service occupation, the activities involved in the manufacture and production of metals into finished product by prescribing the operations involved utilizing available resources, techniques and control in the most economical way without sacrificing quality and the specifications. It includes the application of precision, measuring instruments, knowledge of materials and processes, reading and preparing working drawings, use and operation of machine tools, design and fabrication of jigs, and fixtures for economical production. The refrigeration and airconditioning service occupation activities involved the study of the principles and practical application of domestic, commercial and industrial refrigeration systems. The trainees can assist the engineers in simple design work, interpret and analyze working data, maintain and calibrate control systems. They can also perform specific tasks such as preventive maintenance, installing, repairing and overhauling refrigeration and airconditioning equipment. For each item the student has to response on a 5 point Lickert scale, "1"- that they strongly agree to do the tasks, "2" they agree to do the tasks, "3"- neutral 4- they disagree to do the tasks and " 5"- that they strongly agree to do the tasks.

Results

A Principal Component Analysis with varimax rotation was used to identify the subscales of realistic vocation interest. An examination of the scree plot showed that five subscales can be produced. The five subscales of the realistic factor accounts 62.68% of the total variance in realistic occupations. The five factors were labelled as automotive, electrical mechanical, refrigeration and airconditioning and electronics service occupations. Setting the eigenvalue at 1.0, the items with factor loadings below .40 were removed and 97 items were retained. The 97 items were classified under each subscales: Automotive service occupation (20 items), electronics service occupation (20 items), electrical service occupation (20 items), refrigeration and airconditioning (17 items), and mechanical service occupation (20 items).   The test also indicates a very high internal consistency among the items with a Cronbach's alpha value of .96. The mean obtained is 276.88 and standard deviation is 56.54.

Discussions

The study developed a Realistic Occupational Choice Inventory using skilled, service, technical service occupations as the subscales of the Realistic (R) factor of Holland's RIASEC typology. Results showed that the original items of 100, 5 subscale attained high internal consistency, 3 items were eliminated because each item was already overload with the other subscale. An examination of the scree plot showed

that the five subscale of the realistic factor can be retained. The decision on each subscale was based on the Map-of the-World (Counselor Version) developed by Prediger et. al (1993) as cited by Brown (2007) stated that the Map-of the-World shows the location of families jobs and based on their relationships to four primary work tasks: Working with data, people, things, and ideas. These job families are in congruent with the Holland typology in terms of administration and sales (enterprising), business operations (conventional), technical (realistic), science and technology (investigative), arts (artistic), and social service (social) (Louis, 2010). The decision to use the Map-of-the-World as an added guide to determining the subscales was to ensure that there was already an established framework using these subscales which were related to the Holland typology (Louis, 2010). The Map-of-the World became the additional reference in constructing the subscales for Realistic (R) based on Holland's typology as it was categorized as technical service occupations. The consequences of taking a vocational choice not congruent to individual occupational interest are mostly shifting of courses and poor academic performance. With this problems encountered by the students, the guidance program should be strengthened with the cooperation and endeavour of all mentors in conducting supplementary training, seminars, orientations and similar activities to develop students' potentials and interest that will lead to the enhancement of their self-esteem. The Realistic Occupational Choice Inventory is a response to the research findings and recommendation of Holland Theory of Vocational Choice. It is simple occupational scale devised to explore the relationships hypothesized in the theory and to examined and classified typical occupations. The kind of work that individual prefers to be involved can be perceived with his vocational and occupational choice test results.

The educational institutions should help their students in assessing the person capabilities in pursuing a vocational choice that will fit their occupational interest. It is the duty of every technical instructor to equip their students with the necessary knowledge and skills to be immediately productive in their job. Each worker must be confident in his/her skills and, he/she must possess the proper values needed to perform well in the industry. The role of educational higher learning is to assess the competencies of their students in order to develop their potentials to the fullest, prepare them for work and equip them for occupations. The institutions should analyze the productivity, motivational factors and manpower composition in various industries and their units that will help build up reliable national estimates of workforce, skill, productivity and other related matters in different sectors of the economy.

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